



Marysville Otisco Nabb Water Corporation

Water Distribution Standards

Purpose

The purpose of this policy is to establish uniform standards for the design, installation, and maintenance of MON Water's distribution system to ensure reliable water service, regulatory compliance, public health protection, and fire safety in accordance with the Indiana Department of Environmental Management (IDEM) regulations.

Scope

This policy applies to all new water main extensions, system upgrades, and service connections within MON Water's service territory, whether installed by MON Water or private developers.

Minimum Water Main Distribution Sizes

General Distribution Mains

Minimum Size: 8 inches in diameter.

Intended for general water supply throughout the distribution system, ensuring adequate flow and pressure.

Fire Hydrant Supply Lines

Minimum Size: 6 inches in diameter.

All mains intended to supply fire hydrants must meet this minimum to maintain fire protection flow requirements.

Cul-de-sacs and Dead Ends

Minimum Size: 4 inches in diameter.

Designed to maintain sufficient flow at terminal points of the system

Service Connections

Minimum Size: ¾ inch in diameter.

For individual residential or commercial service connections. Must be adequately sized based on expected demand.

Small-Scale Uses

Minimum Size: 1 inch in diameter.

May be allowed only for limited-use cases such as irrigation, when not connected to fire protection services and where approved by MON Water engineering staff.

Design and Installation Requirements

- **Hydraulic Modeling:** Required for all projects where small diameter mains are serving the area, regardless of length or demand. Additionally, modeling is required for any main extension over 1,000 feet or for projects with a projected demand of 20 or more EDU (Equivalent Dwelling Units).
- **Materials:** All materials must meet or exceed AWWA and IDEM standards. The approved materials list is located in Appendix A.
- **Installation Guidelines:** The installation must meet AWWA, IDEM, 10-State Standards as identified in the installation guide located in Appendix B.
- **Looping and Redundancy:** Water mains must be looped where possible to improve reliability and reduce stagnation.
- **Valves and Hydrants:** Installed per MON Water specifications for isolation and fire protection.

Exceptions and Variances

Requests for deviations from this policy must be submitted in writing to MON Water and approved by the Facilities Manager. Justifications must be based on sound engineering and/or site-specific constraints.

Compliance

All installations must comply with:

- IDEM rules and regulations (including 327 IAC 8)

- AWWA standards
 - Local ordinances and applicable fire codes
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Enforcement

Non-compliant installations will not be accepted into the MON Water system. The responsible party will be required to make corrections at their expense before service will be activated.

Recordkeeping and Documentation

All projects must submit as-built drawings, pressure test results, disinfection reports, and other required documentation before MON Water will grant final approval.

Appendix A: MON Approved Materials List

1. Pipe Materials

- **Ductile Iron Pipe (DIP) – AWWA Standard C151**
 - **Manufacturing:** Pipe must be centrifugally cast in either metal or sand molds and made from ductile iron (nodular graphite iron), which combines strength, toughness, and corrosion resistance.
 - **Material Properties:**
 - Minimum tensile strength: $\geq 60,000$ psi
 - Minimum yield strength: $\geq 42,000$ psi
 - Minimum elongation: $\geq 10\%$
 - **Joints and Fittings Compatibility:** Pipes may be supplied with push-on joints, mechanical joints, or other proprietary systems and must be compatible with fittings manufactured to AWWA C110, C111, or equivalent.
 - **Wall Thickness:** Classified by “Thickness Class” (e.g., Class 52, Class 50), which defines the pipe wall thickness for pressure handling and external loading. Thickness class selection is based on design criteria: pressure, trench conditions, and earth load.

- **Coatings and Linings:** Cement-mortar lining per AWWA C104 is standard for internal corrosion protection. Bituminous outside coating is commonly applied unless specified otherwise.
- **Markings:** Pipe must be marked with the manufacturer's name, nominal diameter, class or thickness, and date of manufacture.
- **Encasement:** Pipe must be wrapped with polyethylene per AWWA C105.
- **Inspection and Testing:**
 - **Hydrostatic test:** Each pipe must withstand a pressure test (typically 500 psi or more depending on size).
 - Pipes must be free of cracks, blisters, or other manufacturing defects.
- **PVC Pressure Pipe (4"–60") – AWWA Standard C900**
 - **Pressure Classes (PC) & DR (Dimension Ratio):**
 - Minimum Requirement: DR 18 – 235 psi
 - DR 14 – 305 psi

Pressure rating is based on a design factor of 2.0, per potable water safety standards.
 - **Material Requirements:**
 - PVC compound must meet ASTM D1784, with minimum cell classification 12454 or 12364.
 - Must be NSF 61 certified or equivalent for potable water safety and health standards.
 - **Joints:**
 - Pipes typically use integral bell and spigot joints with elastomeric gaskets.
 - Joints must comply with ASTM D3139 for performance and ASTM F477 for gasket quality.
 - Designed for leak-free, flexible joints appropriate for buried water infrastructure.
 - **Marking:** Each pipe must be clearly marked with:
 - Manufacturer's name

- Nominal size and DR
- Pressure class
- AWWA C900 designation
- NSF or equivalent certification for drinking water
- Production date or code
- **Testing Requirements:**
 - Hydrostatic Pressure Test
 - Impact and Flattening Tests
 - Tensile Strength Verification. Ensures structural integrity, leak resistance, and safety under expected service conditions.
- **Safety and Health Compliance:** Must be certified for use in drinking water systems in accordance with ANSI/NSF Standard 61.
- **High-Density Polyethylene (HDPE) Pipe** (*as approved*)
 - Standard: AWWA C906
 - Minimum Pressure Rating: 200 psi

2. Fittings

- **Ductile Iron Fittings**
 - Standard: AWWA C110 or AWWA C153
 - Joint: Mechanical Joint (MJ) or Flanged
 - Coating: Cement-mortar lined per AWWA C104
- **PVC Fittings**
 - Standard: AWWA C907
 - Pressure Rating: Match pipe rating

3. Valves

- **Gate Valves (Resilient-Seated)**
 - Standard: AWWA C509 or C515
 - Configuration: MJ or Flanged Ends
- **Butterfly Valves (larger mains)**
 - Standard: AWWA C504
 - Pressure Class: 150B minimum
- **Tapping Valves and Sleeves**
 - Standard: AWWA C509/C515 & MSS-SP-60
 - Material: Ductile Iron Body

4. Hydrants

- **Dry Barrel Fire Hydrants**
 - Standard: AWWA C502
 - Bury Depth: As specified by local frost depth
 - Inlet: 6" MJ with auxiliary gate valve

5. Appurtenances & Accessories

- **Corporation Stops**
 - Standard: AWWA C800
 - Material: Lead-free brass
- **Curb Stops**
 - Standard: AWWA C800
 - Type: Ball Valve Type
- **Service Tubing**
 - Type K Copper (AWWA C800)
 - HDPE or PEX: Must meet AWWA C901
- **Meter Setters & Yokes**
 - Material: Lead-free brass
 - Conform to AWWA C800

6. Joint Restraint Systems

- **Mechanical Joint Restraints**
 - Approved products: Megalug, Uni-Flange, etc.
 - Standard: AWWA C111
- **Thrust Blocking**
 - Material: Concrete bearing against undisturbed soil
 - As per utility's standard detail

7. Disinfection and Testing

- **Disinfection**
 1. Standard: AWWA C651
 2. Method: Chlorination, flushing, and bacteriological testing
- **Hydrostatic Testing per AWWA Standard C600**
 1. **Test Preparation:**
 - a) Pipe must be fully installed and backfilled, with all thrust restraints, fittings, valves, and appurtenances in place.
 - b) All air must be expelled from the pipeline using air release valves or taps at high points.
 - c) Pipe should be filled slowly with water and allowed to stabilize at test pressure for a minimum of 2 hours before starting the test.

2. Test Pressure:

- a) Minimum test pressure is typically 1.5 times the working pressure, but not less than 150 psi.
- b) For PVC pipe (per AWWA C605), the pressure should not exceed the pressure class rating of the pipe $\times 1.5$.

3. Duration of Test: Standard duration is 2 hours

4. Allowable Leakage (if applicable):

- a) For **ductile iron** (C600): A small amount of leakage is allowable and calculated using a formula:
$$L = \frac{S \times D \times P}{133,200}$$
$$L = 133,200 \frac{S \times D \times P}{\sqrt{P}}$$

L = allowable leakage in gallons per hour
S = length of test section in feet
D = nominal pipe diameter in inches
P = average test pressure (psi)
- b) For **PVC pipe** (C605): **No leakage is permitted**. Any observed leakage or pressure loss must be investigated and corrected.

5. Acceptance Criteria:

- a) The pipeline passes if it holds the test pressure for the duration without pressure loss and stays within allowable leakage limits (if any apply).
- b) Leaks must be repaired, and the system retested until passing results are achieved.

Best Practices:

- Always verify that all valves are open and hydrants are closed during the test.
- Record initial and final pressure and water volumes added (if any) during the test.
- Document results as part of the project closeout and as-built records.